

# **MAJOR STORM WATER MANAGEMENT PLAN (SWMP) FOR TURVEY DG PIT**

**May 19, 2009**

**Prepared by**

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## Storm Water Management Plan For Priority Projects (Major SWMP)

The Major Stormwater Management Plan (Major SWMP) must be completed in its entirety and accompany applications to the County for a permit or approval associated with certain types of development projects. To determine whether your project is required to submit a Major or Minor SWMP, please reference the County's Stormwater Intake Form for Development Projects.

|                                                              |                                                               |
|--------------------------------------------------------------|---------------------------------------------------------------|
| Project Name:                                                | Turvey DG Pit                                                 |
| Permit Number (Land Development Projects):                   | P01-009/RP01-001                                              |
| Work Authorization Number ( <b>CIP only</b> ):               |                                                               |
| Applicant:                                                   | Mark Turvey                                                   |
| Applicant's Address:                                         | 15570 El Capitan Peak, El Cajon, CA 92021                     |
| Plan Prepare By ( <i>Leave blank if same as applicant</i> ): | Chang Consultants, P.O. Box 9496<br>Rancho Santa Fe, CA 92067 |
| Date:                                                        | February 16, 2009                                             |
| Revision Date (If applicable):                               |                                                               |

The County of San Diego Watershed Protection, Storm Water Management, and Discharge Control Ordinance (WPO) (Ordinance No. 9424) requires all applications for a permit or approval associated with a Land Disturbance Activity to be accompanied by a Storm Water Management Plan (SWMP) (section 67.806.b). The purpose of the SWMP is to describe how the project will minimize the short and long-term impacts on receiving water quality. Projects that meet the criteria for a priority development project are required to prepare a Major SWMP.

Since the SWMP is a living document, revisions may be necessary during various stages of approval by the County. Please provide the approval information requested below.

| Project Stages   | Does the SWMP need revisions? |    | If YES, Provide Revision Date |
|------------------|-------------------------------|----|-------------------------------|
|                  | YES                           | NO |                               |
| First Submittal  |                               | X  |                               |
| Second Submittal | X                             |    | September 29, 2008            |
| Third Submittal  | X                             |    | February 16, 2009             |

Instructions for a Major SWMP can be downloaded at <http://www.co.san-diego.ca.us/dpw/stormwater/susmp.html>.

Completion of the following checklists and attachments will fulfill the requirements of a Major SWMP for the project listed above.

## PROJECT DESCRIPTION

Please provide a brief description of the project in the following box. Please include:

- Project Location
- Project Description
- Physical Features (Topography)
- Surrounding Land Use
- Proposed Project Land Use
- Location of dry weather flows (year-round flows in streams, or creeks) within project limits, if applicable.

The Turvey DG Pit project is located south of the intersection of Alpine Boulevard and Viewside Lane in San Diego County. The project proposes a surface mining operation that will produce approximately 191,000 cubic yards of decomposed granite (DG). The pre-project site topography consists of a natural south facing hillside and an existing grading operation at the base of the hillside. The lower portion of the hillside will be used for the proposed operations.

The extraction process will create nearly level pad areas. Operations will be conducted using conventional earth moving equipment and will continue for approximately 10 years. Material will be extracted and screened and then trucked off-site to satisfy the needs of construction projects.

Following completion of extractive operations, the site will be reclaimed in phases and will then be utilized as a wholesale box tree nursery. The project is located on a 47-acre parcel with extractive operations proposed for approximately 12 acres of the site. Current conditions include just over 4 acres of the site involved with grading activities authorized by Grading Permit L-13349. Upon completion, this grading permit will result in the creation of two nearly level pads, which are to be used for a wholesale box tree nursery.

The surrounding land uses include Interstate 8 immediately to the north, an industrial site immediately to the east, natural hillside areas to the south, and rural residential development to the west.

Since the area tributary to the site contains a natural hillside with a ridgeline within 1,500 feet of the project area, there are no dry weather flows impacting the site.

## PRIORITY DEVELOPMENT PROJECT DETERMINATION

Please check the box that best describes the project. Does the project meet one of the following criteria?

**Table 1**

| PRIORITY DEVELOPMENT PROJECT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | YES | NO |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|
| Redevelopment that creates or adds at least 5,000 net square feet of additional impervious surface area                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     | X  |
| Residential development of more than 10 units                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     | X  |
| Commercial developments with a land area for development of greater than 1 acre                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     | X  |
| Heavy industrial development with a land area for development of greater than 1 acre                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | X   |    |
| Automotive repair shop(s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     | X  |
| Restaurants, where the land area for development is greater than 5,000 square feet                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     | X  |
| Hillside development, in an area with known erosive soil conditions, where there will be grading on any natural slope that is twenty-five percent or greater, if the development creates 5,000 square feet or more of impervious surface                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     | X  |
| Environmentally Sensitive Areas (ESA): All development located within or directly adjacent to or discharging directly to an ESA (where discharges from the development or redevelopment will enter receiving waters within the ESA), which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10% or more of its naturally occurring condition. "Directly adjacent" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that is composed entirely of flows from the subject development or redevelopment site, and not commingled with flows from adjacent lands. |     | X  |
| Parking Lots 5,000 square feet or more or with 15 parking spaces or more and potentially exposed to urban runoff                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     | X  |
| Streets, roads, highways, and freeways which would create a new paved surface that is 5,000 square feet or greater                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     | X  |
| Retail Gasoline Outlets (RGO) that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     | X  |

**Limited Exclusion:** Trenching and resurfacing work associated with utility projects are not considered Priority Development Projects. Parking lots, buildings and other structures associated with utility projects are subject to the WPO requirements if one or more of the criteria above are met.

If you answered **NO** to all the questions, then **STOP**. Please complete a Minor SWMP for your project.

If you answered **YES** to any of the questions, please continue.

## HYDROMODIFICATION DETERMINATION

The following questions provide a guide to collecting information relevant to hydromodification management issues.

**Table 2**

|    | QUESTIONS                                                                                                                                                                                             | YES | NO | Information                                                                           |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|---------------------------------------------------------------------------------------|
| 1. | Will the proposed project disturb 50 or more acres of land? (Including all phases of development)                                                                                                     |     | X  | If YES, continue to 2.<br>If NO, go to 6.                                             |
| 2. | Would the project site discharge directly into channels that are concrete-lined or significantly hardened such as with rip-rap, sackcrete, etc, downstream to their outfall into bays or the ocean?   |     |    | If NO, continue to 3.<br>If YES, go to 6.                                             |
| 3. | Would the project site discharge directly into underground storm drains discharging directly to bays or the ocean?                                                                                    |     |    | If NO, continue to 4.<br>If YES, go to 6.                                             |
| 4. | Would the project site discharge directly to a channel (lined or un-lined) and the combined impervious surfaces downstream from the project site to discharge at the ocean or bay are 70% or greater? |     |    | If NO, continue to 5.<br>If YES, go to 6.                                             |
| 5. | Project is required to manage hydromodification impacts.                                                                                                                                              |     |    | Hydromodification Management Required as described in Section 67.812 b(4) of the WPO. |
| 6. | Project is not required to manage hydromodification impacts.                                                                                                                                          |     | X  | Hydromodification Exempt. Keep on file.                                               |

The “No” response to Item 6 indicates that the project is not subject to hydromodification, i.e., it is exempt.

**An exemption is potentially available for projects that are required (No. 5. in Table 2 above) to manage hydromodification impacts:** The project proponent may conduct an independent geomorphic study to determine the project’s full hydromodification impact. The study must incorporate sediment transport modeling across the range of geomorphically significant flows and demonstrate to the County’s satisfaction that the project flows and sediment reductions will not detrimentally affect the receiving water to qualify for the exemption.

## STORMWATER QUALITY DETERMINATION

The following questions provide a guide to collecting information relevant to project stormwater quality issues. Please provide the following information in a printed report accompanying this form.

**Table 3**

|     | QUESTIONS                                                                                                                                                                                       | COMPLETED | NA |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----|
| 1.  | Describe the topography of the project area.                                                                                                                                                    | X         |    |
| 2.  | Describe the local land use within the project area and adjacent areas.                                                                                                                         | X         |    |
| 3.  | Evaluate the presence of dry weather flow.                                                                                                                                                      | X         |    |
| 4.  | Determine the receiving waters that may be affected by the project throughout all phases of development (i.e., construction, maintenance and operation).                                        | X         |    |
| 5.  | For the project limits, list the 303(d) impaired receiving water bodies and their constituents of concern.                                                                                      | X         |    |
| 6.  | Determine if there are any High Risk Areas (which is defined by the presence of municipal or domestic water supply reservoirs or groundwater percolation facilities) within the project limits. |           | X  |
| 7.  | Determine the Regional Board special requirements, including TMDLs, effluent limits, etc.                                                                                                       | X         |    |
| 8.  | Determine the general climate of the project area. Identify annual rainfall and rainfall intensity curves.                                                                                      | X         |    |
| 9.  | If considering Treatment BMPs, determine the soil classification, permeability, erodibility, and depth to groundwater.                                                                          |           | X  |
| 10. | Determine contaminated or hazardous soils within the project area.                                                                                                                              | X         |    |
| 11. | Determine if this project is within the environmentally sensitive areas as defined in Appendix A of the County SUSMP.                                                                           | X         |    |
| 12. | Determine if this is an emergency project.                                                                                                                                                      |           | X  |

**The response form is provided at the end of the text and before the appendices.**

## TREATMENT BMPs DETERMINATION

Complete the checklist below to determine if Treatment Best Management Practices (BMPs) are required for the project.

**Table 4**

| No. | CRITERIA                                                                                                                                                                                                                            | YES | NO | INFORMATION                                               |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|-----------------------------------------------------------|
| 1.  | Is this an emergency project                                                                                                                                                                                                        |     | X  | If YES, go to 6.<br>If NO, continue to 2.                 |
| 2.  | Have TMDLs been established for surface waters within the project limit?                                                                                                                                                            |     | X  | If YES, go to 5.<br>If NO, continue to 3.                 |
| 3.  | Will the project directly discharge to a 303(d) impaired receiving water body?                                                                                                                                                      |     | X  | If YES, go to 5.<br>If NO, continue to 4.                 |
| 4.  | Is this project within the environmentally sensitive areas as defined on the maps in Appendix A of the <i>County of San Diego Standard Urban Storm Water Mitigation Plan for Land Development and Public Improvement Projects</i> ? |     | X  | If YES, continue to 5.<br>If NO, go to 6.                 |
| 5.  | Provide Treatment BMPs for the project.                                                                                                                                                                                             |     | X  | If YES, go to 7.                                          |
| 6.  | Project is not required to provide Treatment BMPs                                                                                                                                                                                   |     | X  | Document for Project Files by referencing this checklist. |
| 7.  | End                                                                                                                                                                                                                                 | X   |    |                                                           |

Now that the need for a treatment BMPs has been determined, other information is required to complete the SWMP.

## WATERSHED

Please check the watershed(s) for the project.

|                                           |                                              |                                                   |                                         |
|-------------------------------------------|----------------------------------------------|---------------------------------------------------|-----------------------------------------|
| <input type="checkbox"/> San Juan 901     | <input type="checkbox"/> Santa Margarita 902 | <input type="checkbox"/> San Luis Rey 903         | <input type="checkbox"/> Carlsbad 904   |
| <input type="checkbox"/> San Dieguito 905 | <input type="checkbox"/> Penasquitos 906     | <input checked="" type="checkbox"/> San Diego 907 | <input type="checkbox"/> Sweetwater 909 |
| <input type="checkbox"/> Otay 910         | <input type="checkbox"/> Tijuana 911         | <input type="checkbox"/> Whitewater 719           | <input type="checkbox"/> Clark 720      |
| <input type="checkbox"/> West Salton 721  | <input type="checkbox"/> Anza Borrego 722    | <input type="checkbox"/> Imperial 723             |                                         |

Please provide the hydrologic sub-area and number(s)

| Number | Name                      |
|--------|---------------------------|
| 907.14 | Coches Hydrologic Subarea |
|        |                           |

Please provide the beneficial uses for Inland Surface Waters and Ground Waters. Beneficial Uses can be obtained from the Water Quality Control Plan for the San Diego Basin, which is available at the Regional Board office or at <http://www.swrcb.ca.gov/rwqcb9/programs/basinplan.html>.

| SURFACE WATERS               | Hydrologic Unit<br>Basin Number | MUN | AGR | IND | PROC | GWR | FRESH | POW | REC1 | REC2 | BIOL | WARM | COLD | WILD | RARE | SPWN |
|------------------------------|---------------------------------|-----|-----|-----|------|-----|-------|-----|------|------|------|------|------|------|------|------|
| <b>Inland Surface Waters</b> |                                 |     |     |     |      |     |       |     |      |      |      |      |      |      |      |      |
|                              | 907.14                          | 0   |     | X   |      |     |       |     | X    | X    |      | X    |      | X    |      |      |
|                              |                                 |     |     |     |      |     |       |     |      |      |      |      |      |      |      |      |
| <b>Ground Waters</b>         |                                 |     |     |     |      |     |       |     |      |      |      |      |      |      |      |      |
|                              | 907.14                          | X   | X   | X   | 0    |     |       |     |      |      |      |      |      |      |      |      |
|                              |                                 |     |     |     |      |     |       |     |      |      |      |      |      |      |      |      |

\* **Excepted from Municipal**

X Existing Beneficial Use

0 Potential Beneficial Use



## POLLUTANTS OF CONCERN

Using Table 5, identify pollutants that are anticipated to be generated from the proposed priority project categories. Pollutants associated with any hazardous material sites that have been remediated or are not threatened by the proposed project are not considered a pollutant of concern.

**Table 5. Anticipated and Potential Pollutants Generated by Land Use Type**

| <i><b>PDP<br/>Categories</b></i>            | <i><b>General Pollutant Categories</b></i> |                  |              |                     |                |                             |                  |                    |                  |
|---------------------------------------------|--------------------------------------------|------------------|--------------|---------------------|----------------|-----------------------------|------------------|--------------------|------------------|
|                                             | Sediments                                  | Nutrients        | Heavy Metals | Organic Compounds   | Trash & Debris | Oxygen Demanding Substances | Oil & Grease     | Bacteria & Viruses | Pesticides       |
| Detached Residential Development            | X                                          | X                |              |                     | X              | X                           | X                | X                  | X                |
| Attached Residential Development            | X                                          | X                |              |                     | X              | P <sup>(1)</sup>            | P <sup>(2)</sup> | P                  | X                |
| Commercial Development 1 acre or greater    | P <sup>(1)</sup>                           | P <sup>(1)</sup> |              | P <sup>(2)</sup>    | X              | P <sup>(5)</sup>            | X                | P <sup>(3)</sup>   | P <sup>(5)</sup> |
| Heavy industry /industrial development      | X                                          |                  | X            | X                   | X              | X                           | X                |                    |                  |
| Automotive Repair Shops                     |                                            |                  | X            | X <sup>(4)(5)</sup> | X              |                             | X                |                    |                  |
| Restaurants                                 |                                            |                  |              |                     | X              | X                           | X                | X                  |                  |
| Hillside Development >5,000 ft <sup>2</sup> | X                                          | X                |              |                     | X              | X                           | X                |                    | X                |
| Parking Lots                                | P <sup>(1)</sup>                           | P <sup>(1)</sup> | X            |                     | X              | P <sup>(1)</sup>            | X                |                    | P <sup>(1)</sup> |
| Retail Gasoline Outlets                     |                                            |                  | X            | X                   | X              | X                           | X                |                    |                  |
| Streets, Highways & Freeways                | X                                          | P <sup>(1)</sup> | X            | X <sup>(4)</sup>    | X              | P <sup>(5)</sup>            | X                |                    |                  |

X = anticipated

P = potential

(1) A potential pollutant if landscaping exists on-site.

(2) A potential pollutant if the project includes uncovered parking areas.

(3) A potential pollutant if land use involves food or animal waste products.

(4) Including petroleum hydrocarbons.

(5) Including solvents.

**Note:** If other monitoring data that is relevant to the project is available. Please include as Attachment C.

## CONSTRUCTION BMPs

Please check the construction BMPs that may be implemented during construction of the project. The applicant will be responsible for the placement and maintenance of the BMPs incorporated into the final project design.

- |                                                                                                                                                                                                                                                                                                                                           |                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| <input checked="" type="checkbox"/> Silt Fence                                                                                                                                                                                                                                                                                            | <input type="checkbox"/> Desilting Basin                |
| <input checked="" type="checkbox"/> Fiber Rolls                                                                                                                                                                                                                                                                                           | <input checked="" type="checkbox"/> Gravel Bag Berm     |
| <input type="checkbox"/> Street Sweeping and Vacuuming                                                                                                                                                                                                                                                                                    | <input checked="" type="checkbox"/> Sandbag Barrier     |
| <input type="checkbox"/> Storm Drain Inlet Protection                                                                                                                                                                                                                                                                                     | <input type="checkbox"/> Material Delivery and Storage  |
| <input checked="" type="checkbox"/> Stockpile Management                                                                                                                                                                                                                                                                                  | <input type="checkbox"/> Spill Prevention and Control   |
| <input type="checkbox"/> Solid Waste Management                                                                                                                                                                                                                                                                                           | <input type="checkbox"/> Concrete Waste Management      |
| <input checked="" type="checkbox"/> Stabilized Construction Entrance/Exit                                                                                                                                                                                                                                                                 | <input type="checkbox"/> Water Conservation Practices   |
| <input type="checkbox"/> Dewatering Operations                                                                                                                                                                                                                                                                                            | <input type="checkbox"/> Paving and Grinding Operations |
| <input type="checkbox"/> Vehicle and Equipment Maintenance                                                                                                                                                                                                                                                                                |                                                         |
| <input type="checkbox"/> Any minor slopes created incidental to construction and not subject to a major or minor grading permit shall be protected by covering with plastic or tarp prior to a rain event, and shall have vegetative cover reestablished within 180 days of completion of the slope and prior to final building approval. |                                                         |

## EXCEPTIONAL THREAT TO WATER QUALITY DETERMINATION

Complete the checklist below to determine if a proposed project will pose an “exceptional threat to water quality,” and therefore require Advanced Treatment Best Management Practices.

**Table 6**

| <b>N<br/>o.</b> | <b>CRITERIA</b>                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>YES</b> | <b>NO</b> | <b>INFORMATION</b>                                                                                |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|---------------------------------------------------------------------------------------------------|
| 1.              | Is all or part of the proposed project site within 200 feet of waters named on the Clean Water Act (CWA) Section 303(d) list of Water Quality Limited Segments as impaired for sedimentation and/or turbidity? Current 303d list may be obtained from the following site:<br><a href="http://www.swrcb.ca.gov/tmdl/docs/303dlists2006/approved/r9_06_303d_reqtmdls.pdf">http://www.swrcb.ca.gov/tmdl/docs/303dlists2006/approved/r9_06_303d_reqtmdls.pdf</a> |            | X         | If YES, continue to 2.<br>If NO, go to 5.                                                         |
| 2.              | Will the project disturb more than 5 acres, including all phases of the development?                                                                                                                                                                                                                                                                                                                                                                         | X          |           | If YES, continue to 3.<br>If NO, go to 5.                                                         |
| 3.              | Will the project disturb slopes that are steeper than 4:1 (horizontal: vertical) with at least 10 feet of relief, and that drain toward the 303(d) listed receiving water for sedimentation and/or turbidity?                                                                                                                                                                                                                                                |            | X         | If YES, continue to 4.<br>If NO, go to 5.                                                         |
| 4.              | Will the project disturb soils with a predominance of USDA-NRCS Erosion factors $k_f$ greater than or equal to 0.4?                                                                                                                                                                                                                                                                                                                                          |            |           | If YES, continue to 6.<br>If NO, go to 5.                                                         |
| 5.              | Project is not required to use Advanced Treatment BMPs.                                                                                                                                                                                                                                                                                                                                                                                                      |            | X         | Document for Project Files by referencing this checklist.                                         |
| 6.              | Project poses an “exceptional threat to water quality” and is required to use Advanced Treatment BMPs.                                                                                                                                                                                                                                                                                                                                                       |            |           | Advanced Treatment BMPs must be consistent with WPO section 67.811(b)(20)(D) performance criteria |

**Exemption potentially available for projects that require advanced treatment:** Project proponent may perform a Revised Universal Soil Loss Equation, Version 2 (RUSLE 2), Modified Universal Soil Loss Equation (MUSLE), or similar analysis that shows to the County official’s satisfaction that advanced treatment is not required

Now that the need for treatment BMPs has been determined, other information is needed to complete the SWMP.

## SITE DESIGN

To minimize stormwater impacts, site design measures must be addressed. The following checklist provides options for avoiding or reducing potential impacts during project planning. If YES is checked, it is assumed that the measure was used for this project.

**Table 7**

|    | OPTIONS                                                                                                                                                                                                                                                                         | YES | NO | N/A |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|-----|
| 1. | Has the project been located and road improvements aligned to avoid or minimize impacts to receiving waters or to increase the preservation of critical (or problematic) areas such as floodplains, steep slopes, wetlands, and areas with erosive or unstable soil conditions? | X   |    |     |
| 2. | Is the project designed to minimize impervious footprint?                                                                                                                                                                                                                       | X   |    |     |
| 3. | Is the project conserving natural areas where feasible?                                                                                                                                                                                                                         | X   |    |     |
| 4. | Where landscape is proposed, are rooftops, impervious sidewalks, walkways, trails and patios be drained into adjacent landscaping?                                                                                                                                              |     |    | X   |
| 5. | For roadway projects, are structures and bridges be designed or located to reduce work in live streams and minimize construction impacts?                                                                                                                                       |     |    | X   |
| 6. | Can any of the following methods be utilized to minimize erosion from slopes:                                                                                                                                                                                                   | X   |    |     |
|    | 6.a. Disturbing existing slopes only when necessary?                                                                                                                                                                                                                            | X   |    |     |
|    | 6.b. Minimize cut and fill areas to reduce slope lengths?                                                                                                                                                                                                                       | X   |    |     |
|    | 6.c. Incorporating retaining walls to reduce steepness of slopes or to shorten slopes?                                                                                                                                                                                          |     |    | X   |
|    | 6.d. Providing benches or terraces on high cut and fill slopes to reduce concentration of flows?                                                                                                                                                                                | X   |    |     |
|    | 6.e. Rounding and shaping slopes to reduce concentrated flow?                                                                                                                                                                                                                   | X   |    |     |
|    | 6.f. Collecting concentrated flows in stabilized drains and channels?                                                                                                                                                                                                           | X   |    |     |

## LOW IMPACT DEVELOPMENT (LID)

Each numbered item below is a LID requirement of the WPO. Please check the box(s) under each number that best describes the Low Impact Development BMP(s) selected for this project.

**Table 8**

|    |                                                                                                                                    |
|----|------------------------------------------------------------------------------------------------------------------------------------|
| 1. | Conserve natural Areas, Soils, and Vegetation-County LID Handbook 2.2.1                                                            |
|    | <input checked="" type="checkbox"/> Preserve well draining soils (Type A or B)                                                     |
|    | <input checked="" type="checkbox"/> Preserve Significant Trees                                                                     |
|    | <input type="checkbox"/> Other. Description:                                                                                       |
|    | <input type="checkbox"/> 1. Not feasible. State Reason:                                                                            |
| 2. | Minimize Disturbance to Natural Drainages-County LID Handbook 2.2.2                                                                |
|    | <input type="checkbox"/> Set-back development envelope from drainages                                                              |
|    | <input checked="" type="checkbox"/> Restrict heavy construction equipment access to planned green/open space areas.                |
|    | <input type="checkbox"/> Other. Description:                                                                                       |
|    | <input type="checkbox"/> 2. Not feasible. State Reason:                                                                            |
| 3. | Minimize and Disconnect Impervious Surfaces (see 5) -County LID Handbook 2.2.3                                                     |
|    | <input type="checkbox"/> Clustered Lot Design                                                                                      |
|    | <input type="checkbox"/> Items checked in 5?                                                                                       |
|    | <input checked="" type="checkbox"/> Other. Description: The project is for surface mining and will not create impervious surfaces. |
|    | <input type="checkbox"/> 3. Not feasible. State Reason:                                                                            |
| 4. | Minimize Soil Compaction-County LID Handbook 2.2.4                                                                                 |
|    | <input checked="" type="checkbox"/> Restrict heavy construction equipment access to planned green/open space areas                 |
|    | <input type="checkbox"/> Re-till soils compacted by construction vehicles/equipment                                                |
|    | <input checked="" type="checkbox"/> Collect & re-use upper soil layers of development site containing organic Materials            |
|    | <input type="checkbox"/> Other. Description:                                                                                       |
|    | 4. Not feasible. State Reason:                                                                                                     |
| 5. | Drain Runoff from Impervious Surfaces to Pervious Areas-County LID Handbook 2.2.5                                                  |

|                                                         |                                                                                   |
|---------------------------------------------------------|-----------------------------------------------------------------------------------|
| LID Street & Road Design                                |                                                                                   |
| <input type="checkbox"/>                                | Curb-cuts to landscaping                                                          |
| X                                                       | Rural Swales                                                                      |
| <input type="checkbox"/>                                | Concave Median                                                                    |
| <input type="checkbox"/>                                | Cul-de-sac Landscaping Design                                                     |
| <input type="checkbox"/>                                | Other. Description:                                                               |
| LID Parking Lot Design                                  |                                                                                   |
| <input type="checkbox"/>                                | Permeable Pavements                                                               |
| <input type="checkbox"/>                                | Curb-cuts to landscaping                                                          |
| X                                                       | Other. Description: Any on-site drive surfaces and parking lots will be pervious. |
| LID Driveway, Sidewalk, Bike-path Design                |                                                                                   |
| <input type="checkbox"/>                                | Permeable Pavements                                                               |
| <input type="checkbox"/>                                | Pitch pavements toward landscaping                                                |
| X                                                       | Other. Description: the on-site driveway areas will be pervious.                  |
| LID Building Design – N/A                               |                                                                                   |
| <input type="checkbox"/>                                | Cisterns & Rain Barrels                                                           |
| <input type="checkbox"/>                                | Downspout to swale                                                                |
| <input type="checkbox"/>                                | Vegetated Roofs                                                                   |
| X                                                       | Other. Description: No buildings are proposed.                                    |
| LID Landscaping Design                                  |                                                                                   |
| <input type="checkbox"/>                                | Soil Amendments                                                                   |
| X                                                       | Reuse of Native Soils                                                             |
| <input type="checkbox"/>                                | Smart Irrigation Systems                                                          |
| <input type="checkbox"/>                                | Street Trees                                                                      |
| X                                                       | Other. Description: Slopes will be hydroseeded.                                   |
| <input type="checkbox"/> 5. Not feasible. State Reason: |                                                                                   |

## CHANNELS & DRAINAGES

Complete the following checklist to determine if the project includes work in channels.

**Table 9**

| No. | CRITERIA                                                                                                                                                                                                                                                                  | YES | NO | N/A | COMMENTS                          |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|-----|-----------------------------------|
| 1.  | Will the project include work in channels?                                                                                                                                                                                                                                |     | X  |     | If YES go to 2<br>If NO go to 13. |
| 2.  | Will the project increase velocity or volume of downstream flow?                                                                                                                                                                                                          |     |    |     | If YES go to 6.                   |
| 3.  | Will the project discharge to unlined channels?                                                                                                                                                                                                                           |     |    |     | If YES go to 6.                   |
| 4.  | Will the project increase potential sediment load of downstream flow?                                                                                                                                                                                                     |     |    |     | If YES go to 6.                   |
| 5.  | Will the project encroach, cross, realign, or cause other hydraulic changes to a stream that may affect downstream channel stability?                                                                                                                                     |     |    |     | If YES go to 8.                   |
| 6.  | Review channel lining materials and design for stream bank erosion.                                                                                                                                                                                                       |     |    |     | Continue to 7.                    |
| 7.  | Consider channel erosion control measures within the project limits as well as downstream. Consider scour velocity.                                                                                                                                                       |     |    |     | Continue to 8.                    |
| 8.  | Include, where appropriate, energy dissipation devices at culverts.                                                                                                                                                                                                       |     |    |     | Continue to 9.                    |
| 9.  | Ensure all transitions between culvert outlets/headwalls/wingwalls and channels are smooth to reduce turbulence and scour.                                                                                                                                                |     |    |     | Continue to 10.                   |
| 10. | Include, if appropriate, detention facilities to reduce peak discharges.                                                                                                                                                                                                  |     |    |     |                                   |
| 11. | “Hardening” natural downstream areas to prevent erosion is not an acceptable technique for protecting channel slopes, unless pre-development conditions are determined to be so erosive that hardening would be required even in the absence of the proposed development. |     |    |     | Continue to 12.                   |
| 12. | Provide other design principles that are comparable and equally effective.                                                                                                                                                                                                |     |    |     | Continue to 13.                   |
| 13. | End                                                                                                                                                                                                                                                                       | X   |    |     |                                   |

## SOURCE CONTROL

Please complete the following checklist for Source Control BMPs. If the BMP is not applicable for this project, then check N/A only at the main category.

**Table 10**

| BMP |                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                            | YES | NO | N/A |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|-----|
| 1.  | <b>Provide Storm Drain System Stenciling and Signage</b>                                                                                                    |                                                                                                                                                                                                                                                                                                                                                            |     |    |     |
|     | 1.a.                                                                                                                                                        | All storm drain inlets and catch basins within the project area shall have a stencil or tile placed with prohibitive language (such as: “NO DUMPING – DRAINS TO _____”) and/or graphical icons to discourage illegal dumping.                                                                                                                              |     |    | X   |
|     | 1.b.                                                                                                                                                        | Signs and prohibitive language and/or graphical icons, which prohibit illegal dumping, must be posted at public access points along channels and creeks within the project area.                                                                                                                                                                           | X   |    |     |
| 2.  | <b>Design Outdoors Material Storage Areas to Reduce Pollution Introduction</b>                                                                              |                                                                                                                                                                                                                                                                                                                                                            |     |    |     |
|     | 2.a.                                                                                                                                                        | This is a detached single-family residential project. Therefore, personal storage areas are exempt from this requirement.                                                                                                                                                                                                                                  |     |    | X   |
|     | 2.b.                                                                                                                                                        | Hazardous materials with the potential to contaminate urban runoff shall either be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs. | X   |    |     |
|     | 2.c.                                                                                                                                                        | The storage area shall be paved and sufficiently impervious to contain leaks and spills.                                                                                                                                                                                                                                                                   | X   |    |     |
|     | 2.d.                                                                                                                                                        | The storage area shall have a roof or awning to minimize direct precipitation within the secondary containment area.                                                                                                                                                                                                                                       | X   |    |     |
| 3.  | <b>Design Trash Storage Areas to Reduce Pollution Introduction</b>                                                                                          |                                                                                                                                                                                                                                                                                                                                                            |     |    |     |
|     | 3.a.                                                                                                                                                        | Paved with an impervious surface, designed not to allow run-on from adjoining areas, screened or walled to prevent off-site transport of trash; or,                                                                                                                                                                                                        | X   |    |     |
|     | 3.b.                                                                                                                                                        | Provide attached lids on all trash containers that exclude rain, or roof or awning to minimize direct precipitation.                                                                                                                                                                                                                                       | X   |    |     |
| 4.  | <b>Use Efficient Irrigation Systems &amp; Landscape Design</b>                                                                                              |                                                                                                                                                                                                                                                                                                                                                            |     |    |     |
|     | The following methods to reduce excessive irrigation runoff shall be considered, and incorporated and implemented where determined applicable and feasible. |                                                                                                                                                                                                                                                                                                                                                            |     |    |     |
|     | 4.a.                                                                                                                                                        | Employing rain shutoff devices to prevent irrigation after precipitation.                                                                                                                                                                                                                                                                                  | X   |    |     |
|     | 4.b.                                                                                                                                                        | Designing irrigation systems to each landscape area’s specific water requirements.                                                                                                                                                                                                                                                                         | X   |    |     |
|     | 4.c.                                                                                                                                                        | Using flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.                                                                                                                                                                                                                  | X   |    |     |
|     | 4.d.                                                                                                                                                        | Employing other comparable, equally effective, methods to reduce irrigation water runoff.                                                                                                                                                                                                                                                                  | X   |    |     |
| 5.  | <b>Private Roads</b>                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                            |     |    |     |
|     | The design of private roadway drainage shall use at least one of the following                                                                              |                                                                                                                                                                                                                                                                                                                                                            |     |    |     |
|     | 5.a.                                                                                                                                                        | Rural swale system: street sheet flows to vegetated swale or gravel shoulder, curbs at street corners, culverts under driveways and street crossings.                                                                                                                                                                                                      |     | X  |     |



| <b>BMP</b> |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                              | <b>YES</b> | <b>NO</b> | <b>N/A</b> |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|------------|
|            | 5.b.                                                                                                                                                                                                                                                                                                                                                     | Urban curb/swale system: street slopes to curb, periodic swale inlets drain to vegetated swale/biofilter.                                                                                                                                                                                                                    |            | X         |            |
|            | 5.c.                                                                                                                                                                                                                                                                                                                                                     | Dual drainage system: First flush captured in street catch basins and discharged to adjacent vegetated swale or gravel shoulder, high flows connect directly to storm water conveyance system.                                                                                                                               |            | X         |            |
|            | 5.d.                                                                                                                                                                                                                                                                                                                                                     | Other methods that are comparable and equally effective within the project.                                                                                                                                                                                                                                                  | X          |           |            |
| 6.         | <b>Residential Driveways &amp; Guest Parking</b>                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                              |            |           |            |
|            | The design of driveways and private residential parking areas shall use one at least of the following features.                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                              |            |           |            |
|            | 6.a.                                                                                                                                                                                                                                                                                                                                                     | Design driveways with shared access, flared (single lane at street) or wheelstrips (paving only under tires); or, drain into landscaping prior to discharging to the storm water conveyance system.                                                                                                                          |            |           | X          |
|            | 6.b.                                                                                                                                                                                                                                                                                                                                                     | Uncovered temporary or guest parking on private residential lots may be: paved with a permeable surface; or, designed to drain into landscaping prior to discharging to the storm water conveyance system.                                                                                                                   |            |           | X          |
|            | 6.c.                                                                                                                                                                                                                                                                                                                                                     | Other features which are comparable and equally effective.                                                                                                                                                                                                                                                                   |            |           | X          |
| 7.         | <b>Dock Areas</b>                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                              |            |           |            |
|            | Loading/unloading dock areas shall include the following.                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                              |            |           | X          |
|            | 7.a.                                                                                                                                                                                                                                                                                                                                                     | Cover loading dock areas, or design drainage to preclude urban run-on and runoff.                                                                                                                                                                                                                                            |            |           | X          |
|            | 7.b.                                                                                                                                                                                                                                                                                                                                                     | Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.                                                                                                                                                                                                                                |            |           | X          |
|            | 7.c.                                                                                                                                                                                                                                                                                                                                                     | Other features which are comparable and equally effective.                                                                                                                                                                                                                                                                   |            |           | X          |
| 8.         | <b>Maintenance Bays</b>                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                              |            |           |            |
|            | Maintenance bays shall include the following.                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                              |            |           | X          |
|            | 8.a.                                                                                                                                                                                                                                                                                                                                                     | Repair/maintenance bays shall be indoors; or, designed to preclude urban run-on and runoff.                                                                                                                                                                                                                                  |            |           | X          |
|            | 8.b.                                                                                                                                                                                                                                                                                                                                                     | Design a repair/maintenance bay drainage system to capture all wash water, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit. |            |           | X          |
|            | 8.c.                                                                                                                                                                                                                                                                                                                                                     | Other features which are comparable and equally effective.                                                                                                                                                                                                                                                                   |            |           | X          |
| 9.         | <b>Vehicle Wash Areas</b>                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                              |            |           |            |
|            | Priority projects that include areas for washing/steam cleaning of vehicles shall use the following.                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                              |            |           |            |
|            | 9.a.                                                                                                                                                                                                                                                                                                                                                     | Self-contained; or covered with a roof or overhang.                                                                                                                                                                                                                                                                          |            |           | X          |
|            | 9.b.                                                                                                                                                                                                                                                                                                                                                     | Equipped with a clarifier or other pretreatment facility.                                                                                                                                                                                                                                                                    |            |           | X          |
|            | 9.c.                                                                                                                                                                                                                                                                                                                                                     | Properly connected to a sanitary sewer.                                                                                                                                                                                                                                                                                      |            |           | X          |
|            | 9.d.                                                                                                                                                                                                                                                                                                                                                     | Other features which are comparable and equally effective.                                                                                                                                                                                                                                                                   |            |           | X          |
| 10.        | <b>Outdoor Processing Areas</b>                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                              |            |           |            |
|            | Outdoor process equipment operations, such as rock grinding or crushing, painting or coating, grinding or sanding, degreasing or parts cleaning, waste piles, and wastewater and solid waste treatment and disposal, and other operations determined to be a potential threat to water quality by the County shall adhere to the following requirements. |                                                                                                                                                                                                                                                                                                                              |            |           |            |

| <b>BMP</b> |                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                | <b>YES</b> | <b>NO</b> | <b>N/A</b> |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|------------|
|            | 10.a.                                                                                                                                       | Cover or enclose areas that would be the most significant source of pollutants; or, slope the area toward a dead-end sump; or, discharge to the sanitary sewer system following appropriate treatment in accordance with conditions established by the applicable sewer agency.                                                                                                                                | X          |           |            |
|            | 10.b.                                                                                                                                       | Grade or berm area to prevent run-on from surrounding areas.                                                                                                                                                                                                                                                                                                                                                   | X          |           |            |
|            | 10.c.                                                                                                                                       | Installation of storm drains in areas of equipment repair is prohibited.                                                                                                                                                                                                                                                                                                                                       | X          |           |            |
|            | 10.d.                                                                                                                                       | Other features which are comparable or equally effective.                                                                                                                                                                                                                                                                                                                                                      | X          |           |            |
| 11.        | <b>Equipment Wash Areas</b>                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                |            |           |            |
|            | Outdoor equipment/accessory washing and steam cleaning activities shall be.                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                |            |           |            |
|            | 11.a.                                                                                                                                       | Be self-contained; or covered with a roof or overhang.                                                                                                                                                                                                                                                                                                                                                         |            |           | X          |
|            | 11.b.                                                                                                                                       | Be equipped with a clarifier, grease trap or other pretreatment facility, as appropriate                                                                                                                                                                                                                                                                                                                       |            |           | X          |
|            | 11.c.                                                                                                                                       | Be properly connected to a sanitary sewer.                                                                                                                                                                                                                                                                                                                                                                     |            |           | X          |
|            | 11.d.                                                                                                                                       | Other features which are comparable or equally effective.                                                                                                                                                                                                                                                                                                                                                      |            |           | X          |
| 12.        | <b>Parking Areas</b>                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                |            |           |            |
|            | The following design concepts shall be considered, and incorporated and implemented where determined applicable and feasible by the County. |                                                                                                                                                                                                                                                                                                                                                                                                                |            |           |            |
|            | 12.a.                                                                                                                                       | Where landscaping is proposed in parking areas, incorporate landscape areas into the drainage design.                                                                                                                                                                                                                                                                                                          | X          |           |            |
|            | 12.b.                                                                                                                                       | Overflow parking (parking stalls provided in excess of the County's minimum parking requirements) may be constructed with permeable paving.                                                                                                                                                                                                                                                                    | X          |           |            |
|            | 12.c.                                                                                                                                       | Other design concepts that are comparable and equally effective.                                                                                                                                                                                                                                                                                                                                               | X          |           |            |
| 13.        | <b>Fueling Area</b>                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                |            |           |            |
|            | Non-retail fuel dispensing areas shall contain the following.                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                |            |           | X          |
|            | 13.a.                                                                                                                                       | Overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area. The fueling area shall drain to the project's treatment control BMP(s) prior to discharging to the storm water conveyance system. |            |           | X          |
|            | 13.b.                                                                                                                                       | Paved with Portland cement concrete (or equivalent smooth impervious surface). The use of asphalt concrete shall be prohibited.                                                                                                                                                                                                                                                                                |            |           | X          |
|            | 13.c.                                                                                                                                       | Have an appropriate slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of urban runoff.                                                                                                                                                                                                                                                           |            |           | X          |
|            | 13.d.                                                                                                                                       | At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.                                                                                                                                                                      |            |           | X          |

Please list other project specific Source Control BMPs in the following box. Write **N/A** if there are none.

**N/A**

## TREATMENT CONTROL

To select a structural treatment BMP using Treatment Control BMP Selection Matrix (Table 11), each priority project shall compare the list of pollutants for which the downstream receiving waters are impaired (if any), with the pollutants anticipated to be generated by the project (as identified in Table 5). Any pollutants identified by Table 5, which are also causing a Clean Water Act section 303(d) impairment of the receiving waters of the project, shall be considered primary pollutants of concern. Priority projects that are anticipated to generate a primary pollutant of concern shall select a single or combination of stormwater BMPs from Table 11, which **maximizes pollutant removal** for the particular primary pollutant(s) of concern.

Priority development projects that are **not** anticipated to generate a pollutant for which the receiving water is CWA 303(d) impaired shall select a single or combination of stormwater BMPs from Table 11, which are effective for pollutant removal of the identified secondary pollutants of concern, consistent with the “maximum extent practicable” standard.

**Table 11. Treatment Control BMP Selection Matrix**

| Pollutants of Concern                                                  | Bioretention Facilities (LID)* | Settling Basins (Dry Ponds) | Wet Ponds and Wetlands | Infiltration Facilities or Practices (LID)* | Media Filters | High-rate biofilters | High-rate media filters | Trash Racks & Hydro-dynamic Devices |
|------------------------------------------------------------------------|--------------------------------|-----------------------------|------------------------|---------------------------------------------|---------------|----------------------|-------------------------|-------------------------------------|
| Coarse Sediment and Trash                                              | High                           | High                        | High                   | High                                        | High          | High                 | High                    | High                                |
| Pollutants that tend to associate with fine particles during treatment | High                           | High                        | High                   | High                                        | High          | Medium               | Medium                  | Low                                 |
| Pollutants that tend to be dissolved following treatment               | Medium                         | Low                         | Medium                 | High                                        | Low           | Low                  | Low                     | Low                                 |

\*Additional information is available in the County of San Diego LID Handbook.

**NOTES ON POLLUTANTS OF CONCERN:**

In Table 12, Pollutants of Concern are grouped as gross pollutants, pollutants that tend to associate with fine particles, and pollutants that remain dissolved.

**Table 12**

| Pollutant         | Coarse Sediment and Trash | Pollutants that tend to associate with fine particles during treatment | Pollutants that tend to be dissolved following treatment |
|-------------------|---------------------------|------------------------------------------------------------------------|----------------------------------------------------------|
| Sediment          | X                         | X                                                                      |                                                          |
| Nutrients         |                           | X                                                                      | X                                                        |
| Heavy Metals      |                           | X                                                                      |                                                          |
| Organic Compounds |                           | X                                                                      |                                                          |
| Trash & Debris    | X                         |                                                                        |                                                          |
| Oxygen Demanding  |                           | X                                                                      |                                                          |
| Bacteria          |                           | X                                                                      |                                                          |
| Oil & Grease      |                           | X                                                                      |                                                          |
| Pesticides        |                           | X                                                                      |                                                          |

A Treatment BMP must address runoff from developed areas. Please provide the post-construction water quality values for the project. Label outfalls on the BMP map. The Water Quality peak rate of discharge flow ( $Q_{WQ}$ ) and the Water Quality storage volume ( $V_{WQ}$ ) is dependent on the type of treatment BMP selected for the project.

| Outfall | Tributary Area (acres) | $Q_{WQ}$ (cfs) | $V_{WQ}$ (ft <sup>3</sup> )                             |
|---------|------------------------|----------------|---------------------------------------------------------|
| West    | 5.54                   | N/A            | $0.78/12 \times 0.30 \times 5.54 \times 43,560 = 4,706$ |
| East    | 6.45                   |                | $0.78/12 \times 0.30 \times 6.45 \times 43,560 = 5,479$ |

Note:  $V_{WQ} = 85^{\text{th}}$  percentile precipitation  $\times$  runoff coefficient  $\times$  tributary area  
 $85^{\text{th}}$  percentile precipitation (0.78") is from DPW GIS Map  
 Use runoff coefficient = 0.30 (Type C soil and undisturbed natural terrain)  
 Tributary area reflects project footprint

Please check the box(s) that best describes the Treatment BMP(s) selected for this project.

|                                                                                   |
|-----------------------------------------------------------------------------------|
| <b>Biofilters</b>                                                                 |
| <input type="checkbox"/> Bioretention swale                                       |
| <input type="checkbox"/> Vegetated filter strip / bio-filter swale                |
| <input type="checkbox"/> Stormwater Planter Box (open-bottomed)                   |
| <input type="checkbox"/> Stormwater Flow-Through Planter (sealed bottom)          |
| <input type="checkbox"/> Bioretention Area                                        |
| <input type="checkbox"/> Vegetated Roofs/Modules/Walls                            |
| <b>Detention Basins</b>                                                           |
| <input type="checkbox"/> Extended/dry detention basin with grass/vegetated lining |
| <input type="checkbox"/> Extended/dry detention basin with impervious lining      |
| <b>Infiltration Basins</b>                                                        |
| <input checked="" type="checkbox"/> Infiltration basin                            |
| <input type="checkbox"/> Infiltration trench                                      |
| <input type="checkbox"/> Dry well                                                 |
| <input type="checkbox"/> Permeable Paving                                         |
| <input type="checkbox"/> Gravel                                                   |
| <input type="checkbox"/> Permeable asphalt                                        |
| <input type="checkbox"/> Pervious concrete                                        |
| <input type="checkbox"/> Unit pavers, ungrouted, set on sand or gravel            |
| <input type="checkbox"/> Subsurface reservoir bed                                 |
| <b>Wet Ponds or Wetlands</b>                                                      |
| <input type="checkbox"/> Wet pond/basin (permanent pool)                          |
| <input type="checkbox"/> Constructed wetland                                      |
| <b>Filtration</b>                                                                 |
| <input type="checkbox"/> Media filtration                                         |
| <input type="checkbox"/> Sand filtration                                          |
| <b>Hydrodynamic Separator Systems</b>                                             |
| <input type="checkbox"/> Swirl Concentrator                                       |
| <input type="checkbox"/> Cyclone Separator                                        |
| <b>Trash Racks and Screens</b>                                                    |

|                                                                                                         |                  |           |
|---------------------------------------------------------------------------------------------------------|------------------|-----------|
| Include Treatment Datasheet as Attachment E. The datasheet should include the following:                | <b>COMPLETED</b> | <b>NO</b> |
| 1. Description of how treatment BMP was designed. Provide a description for each type of treatment BMP. | X                |           |
| 2. Engineering calculations for the BMP(s)                                                              | X                |           |

Please describe why the selected treatment BMP(s) was selected for this project. For projects utilizing a low performing BMP, please provide a detailed explanation.

The project does not discharge directly to a 303(d) water body; therefore, the project pollutants are secondary pollutants. Furthermore, pursuant to Table 4, the project is not required to provide treatment BMPs. The pollutants anticipated from the site according to Table 5 are sediments, heavy metals, organic compounds, trash & debris, oxygen demanding substances, and oil & grease. These are pollutants that tend to associate with fine particles except for trash & debris, which are categorized as coarse sediment and trash. Infiltration facilities were selected for the site because they provide high removal efficiency for these pollutants. A basin will be constructed along the westerly end of the site. In addition, a berm will be constructed near the easterly portion of the site facilitate infiltration.

## MAINTENANCE

Please check the box that best describes the maintenance mechanism(s) for this project. Guidelines for each category are located in Chapter 5, Section 5.2 of the County SUSMP.

| CATEGORY            | SELECTED |    |
|---------------------|----------|----|
|                     | YES      | NO |
| First               | X        |    |
| Second <sup>1</sup> |          | X  |
| Third <sup>1</sup>  |          | X  |
| Fourth              |          | X  |

Note:

1. Projects in Category 2 or 3 may choose to establish or be included in a Stormwater Maintenance Assessment District for the long-term maintenance of treatment BMPs.

## ATTACHMENTS

Please include the following attachments.

| ATTACHMENT |                                                      | COMPLETED | N/A |
|------------|------------------------------------------------------|-----------|-----|
| A          | Project Location Map                                 | X         |     |
| B          | Site Map                                             | X         |     |
| C          | Relevant Monitoring Data                             |           | X   |
| D          | LID and Treatment BMP Location Map                   | X         |     |
| E          | Treatment BMP Datasheets                             | X         |     |
| F          | Operation and Maintenance Program for Treatment BMPs | X         |     |
| G          | Fiscal Resources                                     | X         |     |
| H          | Certification Sheet                                  | X         |     |
| I          | Addendum                                             |           | X   |

**Note:** Attachments A and B may be combined.

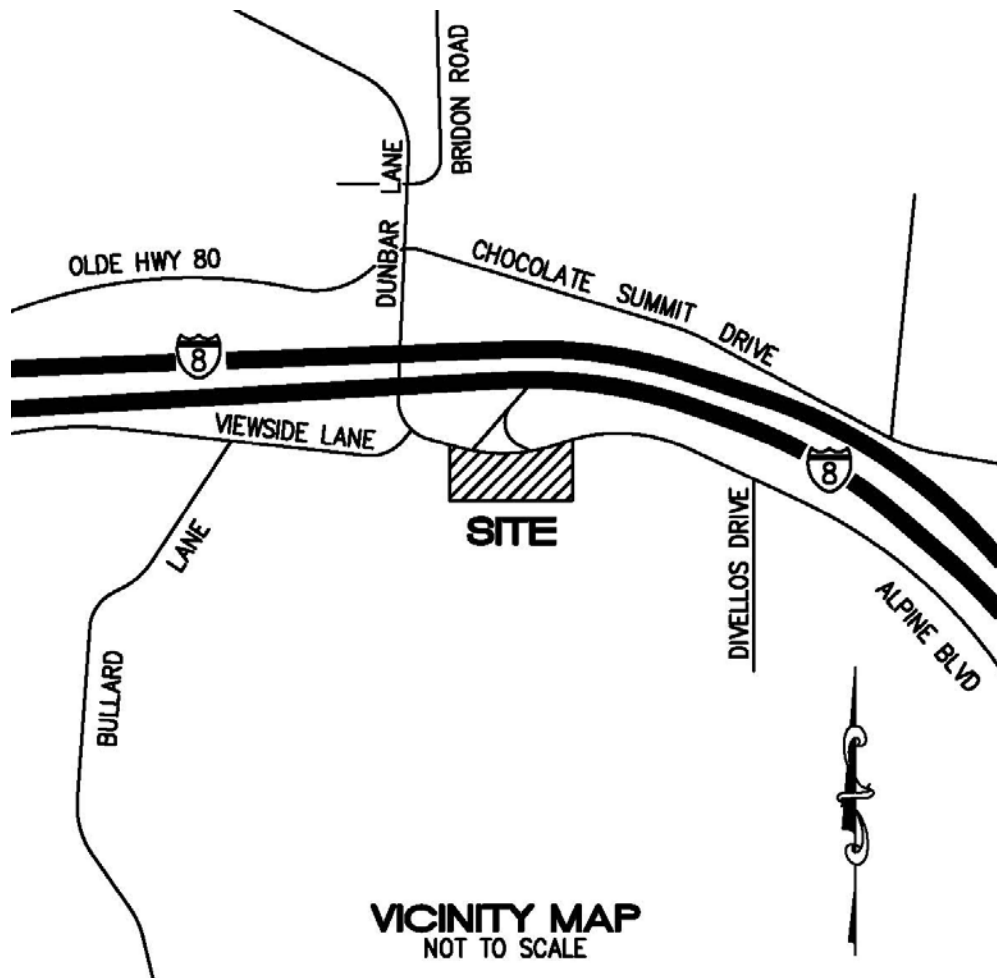
## SUMMARY

The following responds to the items on Table 3 of the SWMP.

1. The site is located within a natural south facing hillside. An existing grading operation is located near the base of the hillside. The hillside slope is steeper near the upper range of elevations and flattens near the bottom, which is typical of the region.
2. The surrounding land uses include Interstate 8 immediately to the north, an industrial site immediately to the east, natural hillside areas to the south, and rural residential development to the west.
3. Since the area tributary to the site contains a natural hillside with a ridgeline within 1,500 feet of the project area, there are no dry weather flows impacting the site.
4. Surface runoff from the site will be collected by one of three existing storm drain facilities along the northerly property boundary. The easterly and central drainage facilities collect runoff from the site along the southerly edge of Alpine Boulevard. The westerly drainage facility collects runoff along the southerly edge of Viewside Lane. These ultimately outlet into Los Coches Creek. There will be no direct impacts to the creek during construction, maintenance, or operation.
5. There are no 303(d) impaired water bodies within the project limits or near the project vicinity according to the June 28, 2007 list.
6. There are no municipal or domestic water supply reservoirs or groundwater facilities within the project limits.
7. The Regional Board does not have special requirements (TMDLs, effluent limits, etc.) for the project site or its immediate receiving water body.
8. The climate in the project area is semi-arid. According to the National Weather Service's "Average Annual Precipitation" graphic for Southern California, the average annual precipitation at the site is approximately 15 inches. The 100-year, 6- and 24-hour rainfall values from the County of San Diego *Hydrology Manual* are 3 and 6.5 inches, respectively.
9. Pursuant to Table 4 in the SWMP treatment BMPs are not required.
10. There are no known contaminated or hazardous soils with the project area.
11. The project is not within an environmentally sensitive area as defined by the County of San Diego.
12. The project is not an emergency project.

# ATTACHMENT A

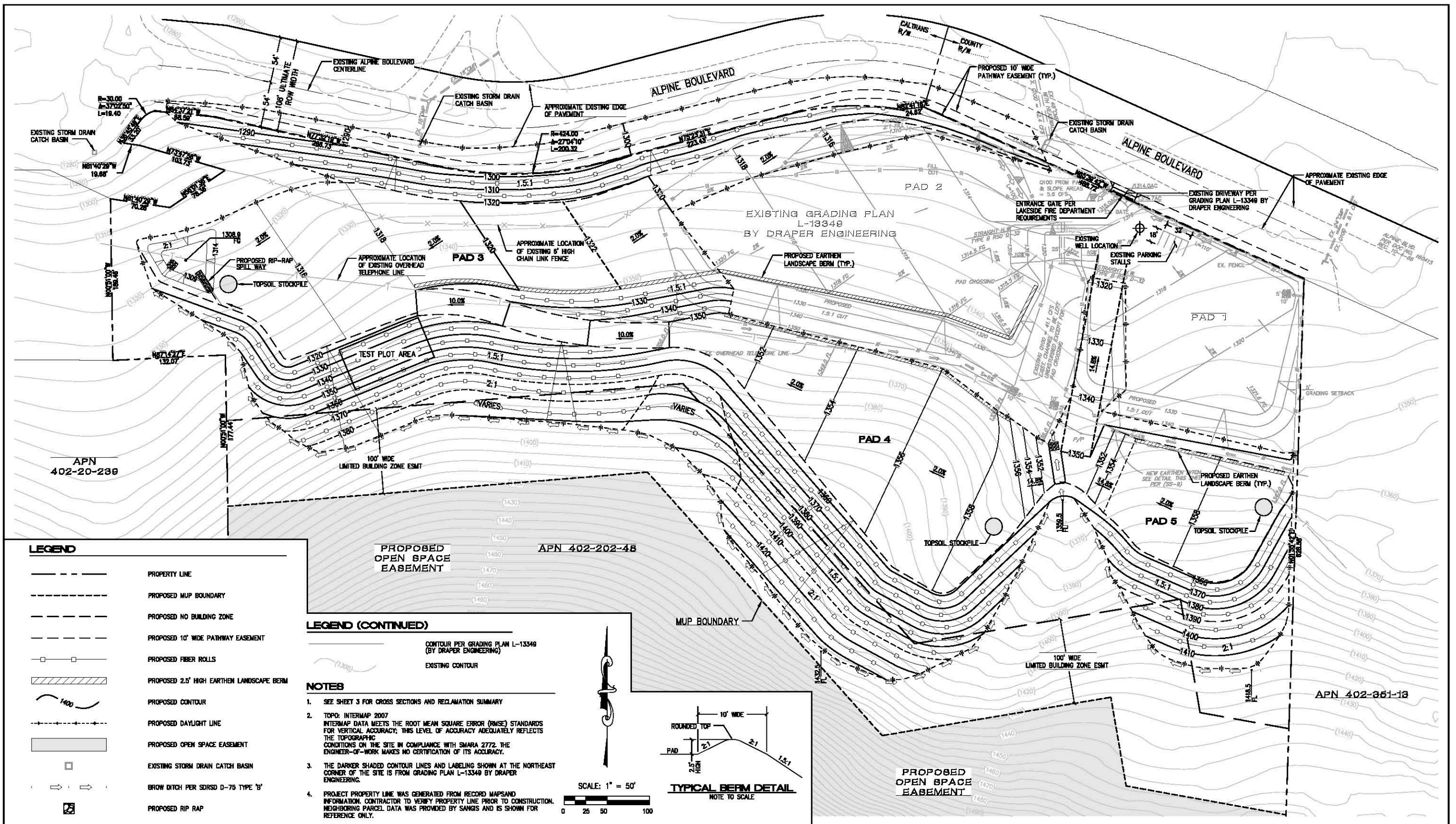
## PROJECT LOCATION MAP





# **ATTACHMENT B**

## **SITE MAP**



| OPERATOR      |                                                       | DECLARATION OF RESPONSIBLE CHARGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                              | COUNTY OF SAN DIEGO |  | DPLU APPROVED CHANGES |             |                   |             | RECORD PLAN       |            | PRIVATE CONTRACT                                         |                                                                                                   |                                                                                                                                                                     |
|---------------|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------------|--|-----------------------|-------------|-------------------|-------------|-------------------|------------|----------------------------------------------------------|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NAME:         | MARK TURVEY                                           | <p>I HEREBY DECLARE THAT I AM THE ENGINEER OF WORK FOR THIS PROJECT, THAT I HAVE EXERCISED RESPONSIBILITY CHARGE OVER THE DESIGN OF THE PROJECT AS DEFINED IN SECTION 6703 OF THE BUSINESS AND PROFESSIONS CODE, AND THAT THE DESIGN IS CONSISTENT WITH CURRENT STANDARDS.</p> <p>I UNDERSTAND THAT THE CHECK OF PROJECT DRAWINGS AND SPECIFICATIONS BY THE COUNTY OF SAN DIEGO IS CONFINED TO REVIEW ONLY AND DOES NOT RELIEVE ME, AS ENGINEER OF WORK, OF MY RESPONSIBILITIES FOR PROJECT DESIGN.</p> | <p>APPROVED FOR COMPLIANCE WITH THE ENVIRONMENTAL REVIEW</p> |                     |  | NUMBER                | DESCRIPTION | APPROVED BY       | DATE        | BY:_____          | DATE:_____ | <p>SHEET 2</p> <p>COUNTY OF SAN DIEGO</p> <p>SHEET 3</p> | <p>RECLAMATION PLAN FOR:</p> <p>TURVEY D.G. PIT</p> <p>CALIFORNIA COORDINATE INDEX - 250-1821</p> | <p>APPROVED DIRECTOR OF PLANNING AND LAND USE BY:</p> <p>ENGINEER OF WORK: WAYNE W. CHANG</p> <p>NO: 46348</p> <p>P/01-009/RF01-001</p> <p>RECLAMATION PLAN FOR</p> |
| ADDRESS:      | 15570 EL CAPITAN PEAK<br>EL CAJON, CA 92021           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                              |                     |  |                       |             |                   |             | R.C.E._____       |            |                                                          |                                                                                                   |                                                                                                                                                                     |
| TELEPHONE:    | (619) 443-5045                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                              |                     |  |                       |             |                   |             | EXPIRES:_____     |            |                                                          |                                                                                                   |                                                                                                                                                                     |
| SHORT LEGAL:  | NORTH WEST 1/4 OF SECTION 19 TOWNSHIP 15 S. RANGE 2 E |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                              |                     |  |                       |             |                   |             | BENCH MARK        |            |                                                          |                                                                                                   |                                                                                                                                                                     |
| A.P.M.        | 402-202-48 & 402-202-54                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                              |                     |  |                       |             |                   |             | DESCRIPTION:_____ |            |                                                          |                                                                                                   |                                                                                                                                                                     |
| SITE ADDRESS: | 18215 ALPINE BOULEVARD<br>ALPINE, CA 91901            | BY:_____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | DATE:_____                                                   | APPROVED BY:_____   |  |                       |             | LOCATION:_____    |             |                   |            |                                                          |                                                                                                   |                                                                                                                                                                     |
|               |                                                       | R.C.E._____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | EXPIRES:_____                                                | DATE:_____          |  |                       |             | RECORD FROM:_____ |             |                   |            |                                                          |                                                                                                   |                                                                                                                                                                     |
|               |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                              |                     |  |                       |             | ELEVATION:_____   | DATUM:_____ |                   |            |                                                          |                                                                                                   |                                                                                                                                                                     |

# **ATTACHMENT C**

## **RELEVANT MONITORING DATA**

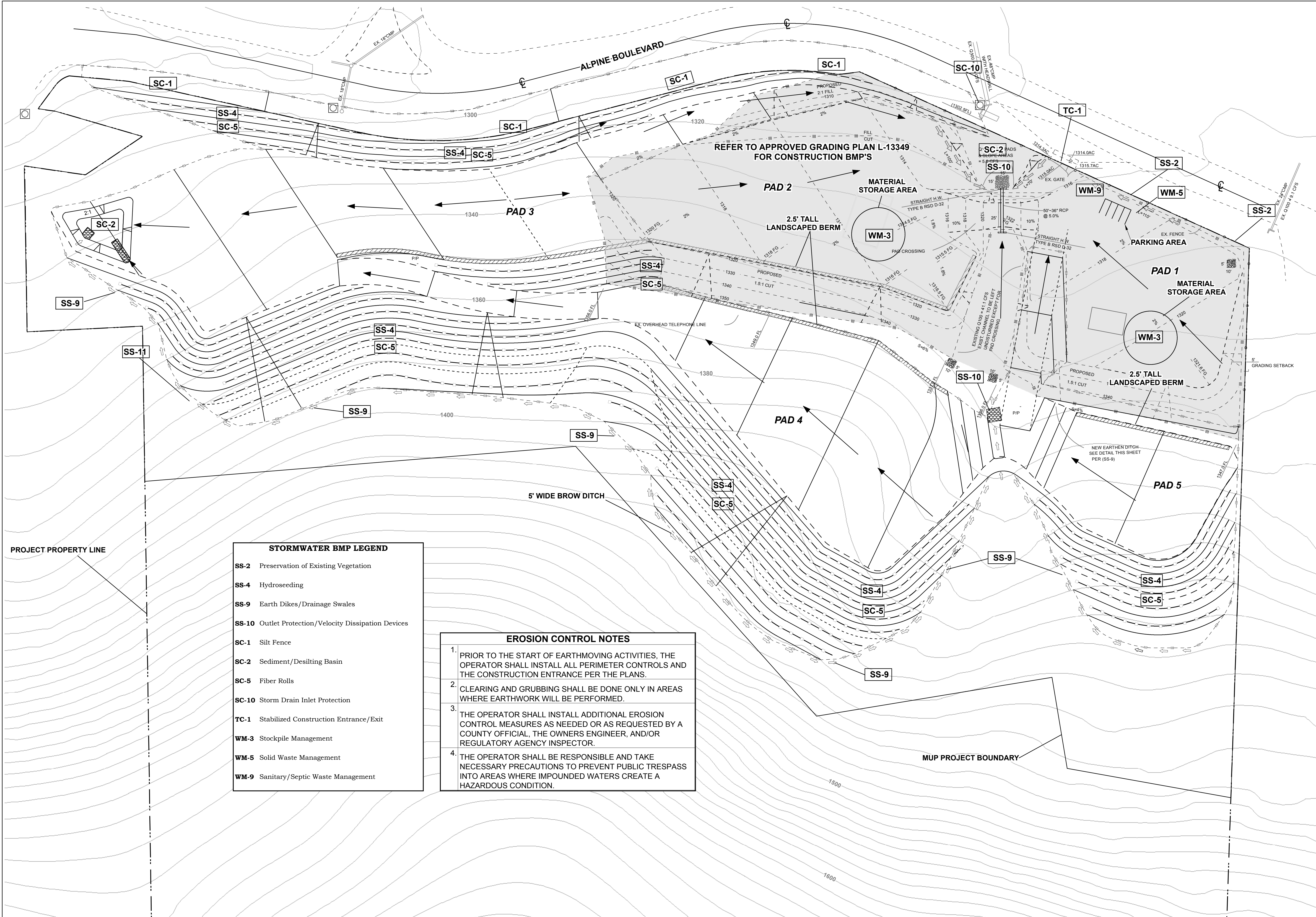
*(NOTE: PROVIDE RELEVANT WATER QUALITY MONITORING DATA IF AVAILABLE.)*

**NOT AVAILABLE**

# **ATTACHMENT D**

## **LID AND TREATMENT BMP LOCATION MAP**





PROJECT PROPERTY LINE

**STORMWATER BMP LEGEND**

- SS-2** Preservation of Existing Vegetation
- SS-4** Hydroseeding
- SS-9** Earth Dikes/Drainage Swales
- SS-10** Outlet Protection/Velocity Dissipation Devices
- SC-1** Silt Fence
- SC-2** Sediment/Desilting Basin
- SC-5** Fiber Rolls
- SC-10** Storm Drain Inlet Protection
- TC-1** Stabilized Construction Entrance/Exit
- WM-3** Stockpile Management
- WM-5** Solid Waste Management
- WM-9** Sanitary/Septic Waste Management

**EROSION CONTROL NOTES**

- PRIOR TO THE START OF EARTHMOVING ACTIVITIES, THE OPERATOR SHALL INSTALL ALL PERIMETER CONTROLS AND THE CONSTRUCTION ENTRANCE PER THE PLANS.
- CLEARING AND GRUBBING SHALL BE DONE ONLY IN AREAS WHERE EARTHWORK WILL BE PERFORMED.
- THE OPERATOR SHALL INSTALL ADDITIONAL EROSION CONTROL MEASURES AS NEEDED OR AS REQUESTED BY A COUNTY OFFICIAL, THE OWNERS ENGINEER, AND/OR REGULATORY AGENCY INSPECTOR.
- THE OPERATOR SHALL BE RESPONSIBLE AND TAKE NECESSARY PRECAUTIONS TO PREVENT PUBLIC TRESPASS INTO AREAS WHERE IMPOUNDED WATERS CREATE A HAZARDOUS CONDITION.

**OWNERS/APPLICANT**

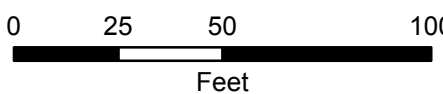
MARK R. TURVEY  
15570 EL CAPITAN PEAK  
EL CAJON, CA 92021  
(619) 443-5045

**ENGINEER OF WORK**

WAYNE CHANG, P.E.  
P.O. BOX 9496  
RANCHO SANTA FE, CA 92067  
(858) 692-0760

**Legend**

- PROPOSED 10' CONTOUR
- EXISTING 10' CONTOUR
- PROPOSED 2.5' TALL EARTHEN LANDSCAPE BERMS
- PROPOSED MUP BOUNDARY
- EXISTING STORM DRAIN CATCH BASIN
- PROPOSED RIP RAP
- PROPERTY LINE
- EXISTING GRADING PLAN L-13349
- ret basin.dxf MultiPatch
- ret basin.dxf Polyline
- PROPOSED BROW DITCH
- DIRECTION OF FLOW
- PROPOSED FIBER ROLLS



1 inch equals 50 feet

DATE

NOTE: THERE WILL BE NO DESIGNATED FUELING AREA ON THE SITE. ALL EQUIPMENT WILL BE REFUELED BY MOBILE SERVICE VEHICLES.

COUNTY OF SAN DIEGO  
DEPARTMENT OF PUBLIC WORKS  
5555 OVERLAND AVENUE, SAN DIEGO, CA 92123-1295



RECOMMENDED BY: \_\_\_\_\_ DATE \_\_\_\_\_  
APPROVED BY: \_\_\_\_\_ DATE \_\_\_\_\_

REVISIONS

BY

APPROVED

DATE

**EnviroMINE Inc.**  
3511 CAMINO DEL RIO SOUTH, SUITE 403  
SAN DIEGO, CA 92109  
(619)284-8515 FAX (619)284-8515

DATE: 5/30/08  
PLOTTED: 11:00 AM  
EV PROJECT NO. 1382  
DESIGN BY: DLG/DM  
DRAWN BY: DLG  
REVIEWED BY: WCH

**LID AND TREATMENT  
BMP LOCATION MAP**

**TURVEY DG PIT  
P01-009/RP01-001**  
1615 ALPINE BLVD. ALPINE, CA 91901



# ATTACHMENT E

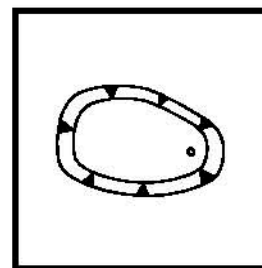
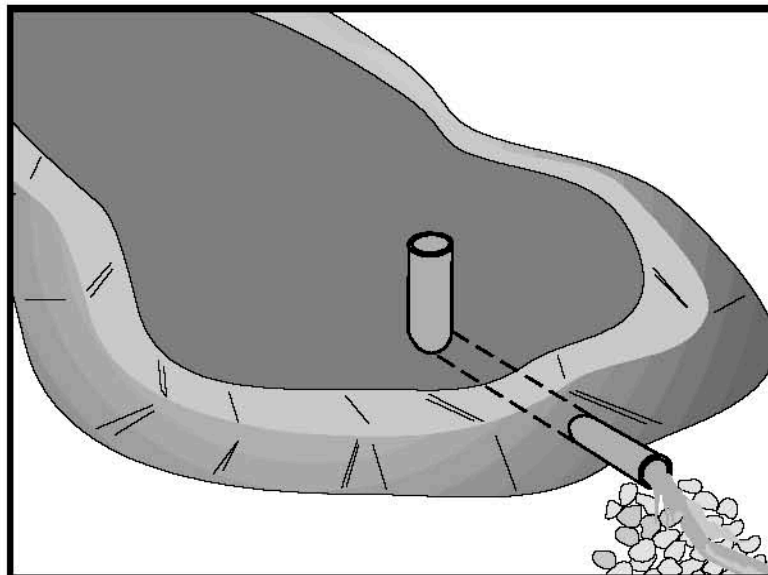
## TREATMENT BMP DATASHEET

(**NOTE:** POSSIBLE SOURCE FOR DATASHEETS CAN BE FOUND AT [WWW.CABMPHANDBOOKS.COM](http://WWW.CABMPHANDBOOKS.COM). INCLUDE ENGINEERING CALCULATIONS FOR SIZING THE TREATMENT BMP.)

The site proposes infiltration basins. The sizing is included in the table:

| Outfall | Tributary Area (acres) | Q <sub>wQ</sub> (cfs) | V <sub>wQ</sub> (ft <sup>3</sup> )                      |
|---------|------------------------|-----------------------|---------------------------------------------------------|
| West    | 5.54                   | N/A                   | $0.78/12 \times 0.30 \times 5.54 \times 43,560 = 4,706$ |
| East    | 6.45                   |                       | $0.78/12 \times 0.30 \times 6.45 \times 43,560 = 5,479$ |

Note:  $V_{wQ} = 85^{\text{th}}$  percentile precipitation  $\times$  runoff coefficient  $\times$  tributary area  
85<sup>th</sup> percentile precipitation (0.78”) is from DPW GIS Map  
Use runoff coefficient = 0.30 (Type C soil and undisturbed natural terrain)  
Tributary area reflects project footprint



Standard Symbol

### BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

### Definition and Purpose

A sediment/desilting basin is a temporary basin formed by excavating and/or constructing an embankment so that sediment-laden runoff is temporarily detained under quiescent conditions, allowing sediment to settle out before the runoff is discharged (refer to Figures 1 and 2).

### Appropriate Applications

Sediment basins shall be designed in accordance with Section A of the State of California NPDES General Permit for Storm Water Discharges Associated with Construction Activities (General Permit). If there is insufficient area to construct a sediment basin in accordance with the General Permit requirements, then the alternate desilting design standards specified herein may be used. This BMP may be implemented on a project-by-project basis with other BMPs when determined necessary and feasible by the RE.

Sediment/Desilting Basins shall be considered for use:

- On construction projects with disturbed areas during the rainy season.
- Where sediment-laden water may enter the drainage system or watercourses.
- At outlets of disturbed soil areas with areas between 2 ha and 4 ha (5 ac and 10 ac).

### Limitations

- Alternative BMPs must be thoroughly investigated for erosion control before selecting temporary desilting basins.
- Requires large surface areas to permit settling of sediment.
- Not appropriate for drainage areas greater than 30 ha (75 ac).
- Not to be located in live streams

## Standards and Specifications

- For safety reasons, basins shall have protective fencing.
- Size may be limited by availability of right-of-way.
- Limit the contributing area to the sediment/desilting basin to only the runoff from the disturbed soil areas. Use temporary concentrated flow conveyance controls to divert runoff from undisturbed areas away from the sediment/desilting basin.

### ***Sediment Basin***

- Sediment basins shall, at a minimum, be designed as follows:
  - Option 1: Pursuant to local ordinance for sediment basin design and maintenance, provided that the design efficiency is as protective or more protective of water quality than Option 3.

OR

- Option 2: Sediment basin(s), as measured from the bottom of the basin to the principal outlet, shall have at least a capacity equivalent to 102 cubic meters (3,600 cubic feet) of storage per 0.4 hectare (1 acre) draining into the sediment basin. The length of the basin shall be more than twice the width of the basin. The length is determined by measuring the distance between the inlet and the outlet; and the depth must not be less than 0.9 m (3 ft) nor greater than 1.5 m (5 ft) for safety reasons and for maximum efficiency.

OR

- Option 3: Sediment basin(s) shall be designed using the standard equation:

$$As = 1.2Q/V_s \quad (\text{Eq. 1})$$

Where:

$As$  = Minimum surface area for trapping soil particles of a certain size

$V_s$  = Settling velocity of the design particle size chosen

$$Q = CIA$$

Where:

$Q$  = Discharge rate measured in cubic feet per second

$C$  = Runoff coefficient

$I$  = Precipitation intensity for the 10-year, 6-hour rain event

$A$  = Area draining into the sediment basin in acres



The design particle size shall be the smallest soil grain size determined by wet sieve analysis, or the fine silt sized (0.01mm) particle, and the  $V_s$  used shall be 100 percent of the calculated settling velocity.

The length is determined by measuring the distance between the inlet and the outlet; the length shall be more than twice the dimension as the width; the depth shall not be less than 0.9 m (3 ft) nor greater than 1.5 m (5 ft) for safety reasons and for maximum efficiency [0.6 m (2 ft) of sediment storage, 0.6 m (2 ft) of capacity]. The basin(s) shall be located on the site where it can be maintained on a year-round basis and shall be maintained on a schedule to retain the 0.6 m (2 ft) of capacity.

OR

- Option 4: The use of an equivalent surface area design or equation, provided that the design efficiency is as protective or more protective of water quality than Option 3.

## ***Desilting Basin***

- Desilting basins shall be designed to have a capacity equivalent to 100 cubic meters of storage (as measured from the top of the basin to the principal outlet) per hectare of contributory area. This design is less than the required to capture the 0.01 mm particle size but larger than that required to capture particles 0.02 mm or larger.
- The length of the basin shall be more than twice the width of the basin; the length shall be determined by measuring the distance between the inlet and the outlet.
- The depth must be no less than one (1) meter nor greater than 1.5 m.
- Basins with an impounding levee greater than 1.5 m (5 ft) tall, measured from the lowest point to the impounding area to the highest point of the levee, and basins capable of impounding more than 1000 cubic meters (35,300 cubic feet), shall be designed by a professional Civil Engineer registered with the state of California. The design must be submitted to the Resident Engineer (RE) for approval at least 7 days prior to the basin construction. The design shall include maintenance requirements, including sediment and vegetation removal, to ensure continuous function of the basin outlet and bypass structures.

## ***General Requirements***

- Design and locate sediment/desilting basins so that they can be maintained. Construct desilting basins prior to the rainy season and construction activities.
- Sediment/desilting basins, regardless of size and storage volume, shall include features to accommodate overflow or bypass flows that exceed the design storm event. The calculated basin volume and proposed location shall be submitted to

the RE for approval at least 3 days prior to the basin construction.

- Construct an emergency spillway to accommodate flows not carried by the principal spillway. Spillway shall consist of an open channel (earthen or vegetated) over undisturbed material (not fill) or constructed of a non-erodible riprap.
- Spillway control section, which is a level portion of the spillway channel at the highest elevation in the channel, shall be a minimum of 6 m (20 ft) in length.
- A forebay, constructed upstream of the basin may be provided to remove debris and larger particles.
- Basin inlets shall be located to maximize travel distance to the basin outlet.
- Rock or vegetation shall be used to protect the basin inlet and slopes against erosion.
- The outflow from the basins shall be provided with outlet protection to prevent erosion and scouring of the embankment and channel. See BMP SS-10, "Outlet Protection/Velocity Dissipation Devices."
- Basin shall be located: (1) by excavating a suitable area or where a low embankment can be constructed across a swale, (2) where post-construction (permanent) detention basins will be constructed, (3) where failure would not cause loss of life or property damage, (4) where the basins can be maintained on a year-round basins to provide access for maintenance, including sediment removal and sediment stockpiling in a protected area, and to maintain the basin to provide the required capacity.
- Areas under embankments, structural works, and sediment/desilting basin must be cleared, stripped of vegetation in accordance with Standard Specifications Section 16 – "Clearing and Grubbing."
- Earthwork shall be in accordance with Standard Specifications Section 19 – "Earthwork". Contractor is specifically directed to Standard Specifications Sections 19-5, "Compaction," and 19-6, "Embankment Construction."
- Structure shall be placed on a firm, smooth foundation with the base securely anchored with concrete or other means to prevent floatation.
- Discharge from the basin shall be accomplished through a water quality outlet. An example is shown in Figure 3. The Principal outlet shall consist of a corrugated metal, high density polyethylene (HDPE), or reinforced concrete riser pipe with dewatering holes and an anti-vortex device and trash rack attached to the top of the riser, to prevent floating debris from flowing out of the basin or obstructing the system. This principal structure shall be designed

to accommodate the inflow design storm.

- A rock pile or rock-filled gabions can serve as alternatives to the debris screen, although the designer should be aware of the potential for extra maintenance involved should the pore spaces in the rock pile clog.
- Proper hydraulic design of the outlet is critical to achieving the desired performance of the basin. The water quality outlet should be designed to drain the basin within 24 to 72 hours (also referred to as “drawdown time”). (The 24-hour limit is specified to provide adequate settling time; the 72-hour limit is specified to mitigate vector control concerns.)
- The two most common outlet problems that occur are: (1) the capacity of the outlet is too great resulting in only partial filling of the basin and drawdown time less than designed for; and (2) the outlet clogs because it is not adequately protected against trash and debris. To avoid these problems, the following outlet types are recommended for use: (1) a single orifice outlet with or without the protection of a riser pipe, and (2) perforated riser. Design guidance for single orifice and perforated riser outlets are as follows:

### ***Flow Control Using a Single Orifice At The Bottom Of The Basin***

**(Figure 1):** The outlet control orifice should be sized using the following equation:

$$a = \frac{2A(H - H_o)^{0.5}}{3600CT(2g)^{0.5}} = \frac{(7 \times 10^{-5})A(H - H_o)^{0.5}}{CT} \quad (\text{Eq. 2})$$

where:

- $a$  = area of orifice (ft<sup>2</sup>) (1 ft<sup>2</sup> = 0.0929m<sup>2</sup>)
- $A$  = surface area of the basin at mid elevation (ft<sup>2</sup>)
- $C$  = orifice coefficient
- $T$  = drawdown time of full basin (hrs)
- $G$  = gravity (32.2 ft/s<sup>2</sup>)
- $H$  = elevation when the basin is full (ft)
- $H_o$  = final elevation when basin is empty (ft)

With a drawdown time of 40 hours, the equation becomes:

$$a = \frac{(1.75 \times 10^{-6})A(H - H_o)^{0.5}}{C} \quad (\text{Eq. 3})$$

### ***Flow Control Using Multiple Orifices (see Figure2):***

$$a_t = \frac{2A(h_{\max})}{CT(2g[h_{\max} - h_{\text{centroid of orifices}}])^{0.5}} \quad (\text{Eq. 4})$$

With terms as described above except:

$a_t$  = total area of orifices

$h_{\max}$  = maximum height from lowest orifice to the maximum water surface (ft)

$h_{\text{centroid of orifices}}$  = height from the lowest orifice to the centroid of the orifice configuration (ft)

Allocate the orifices evenly on two rows; separate the holes by 3x hole diameter vertically, and by 120 degrees horizontally (refer to Figure 3).

Because basins are not maintained for infiltration, water loss by infiltration should be disregarded when designing the hydraulic capacity of the outlet structure.

Care must be taken in the selection of "C"; 0.60 is most often recommended and used. However, based on actual tests, GKY (1989), "Outlet Hydraulics of Extended Detention Facilities for Northern Virginia Planning District Commission", recommends the following:

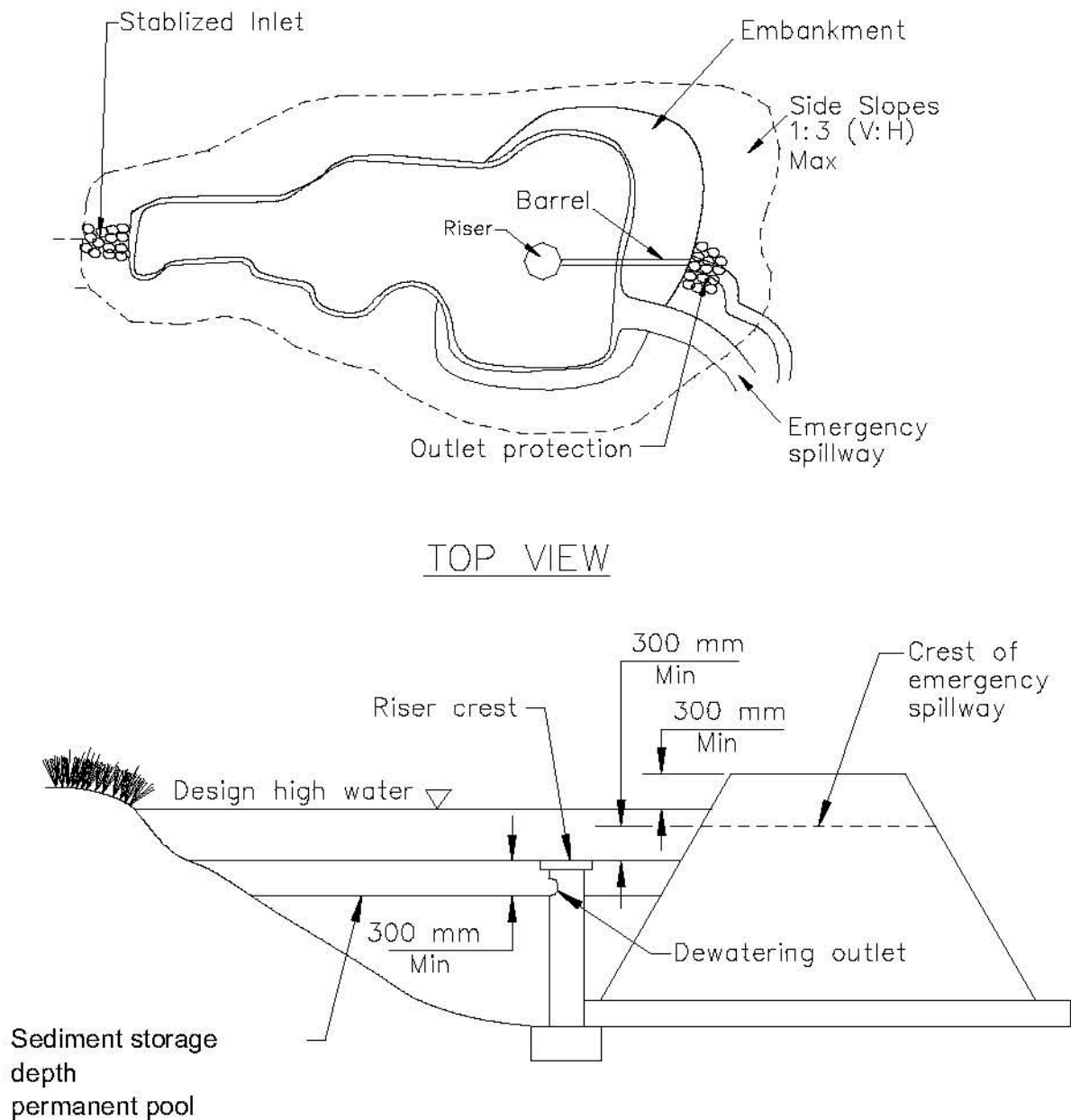
C = 0.66 for thin materials; where the thickness is equal to or less than the orifice diameter, or

C = 0.80 when the material is thicker than the orifice diameter

- The Contractor shall verify that the outlet is properly designed to handle the design and peak flows.
  - Attach riser pipe (watertight connection) to a horizontal pipe (barrel), which extends through the embankment to toe of fill. Provide anti-seep collars on the barrel.
  - Cleanout level shall be clearly marked on the riser pipe
  - Avoid dewatering of groundwater to the sediment/desilting basin during the rainy season. Insignificant quantities of accumulated precipitation may be dewatered to the sediment/desilting basin unless precipitation is forecasted within 24 hours. Refer to NS-2 "Dewatering Operations."
  - Chain link fencing shall be provided around each sediment/desilting basin to prevent unauthorized entry to the basin or if safety is a concern. Fencing shall be in accordance with Standard Specifications Section 80 – "Fencing."
- Maintenance and Inspection
- Inspect sediment/desilting basins before and after rainfall events and weekly during the rest of the rainy season. During extended rainfall events, inspect at

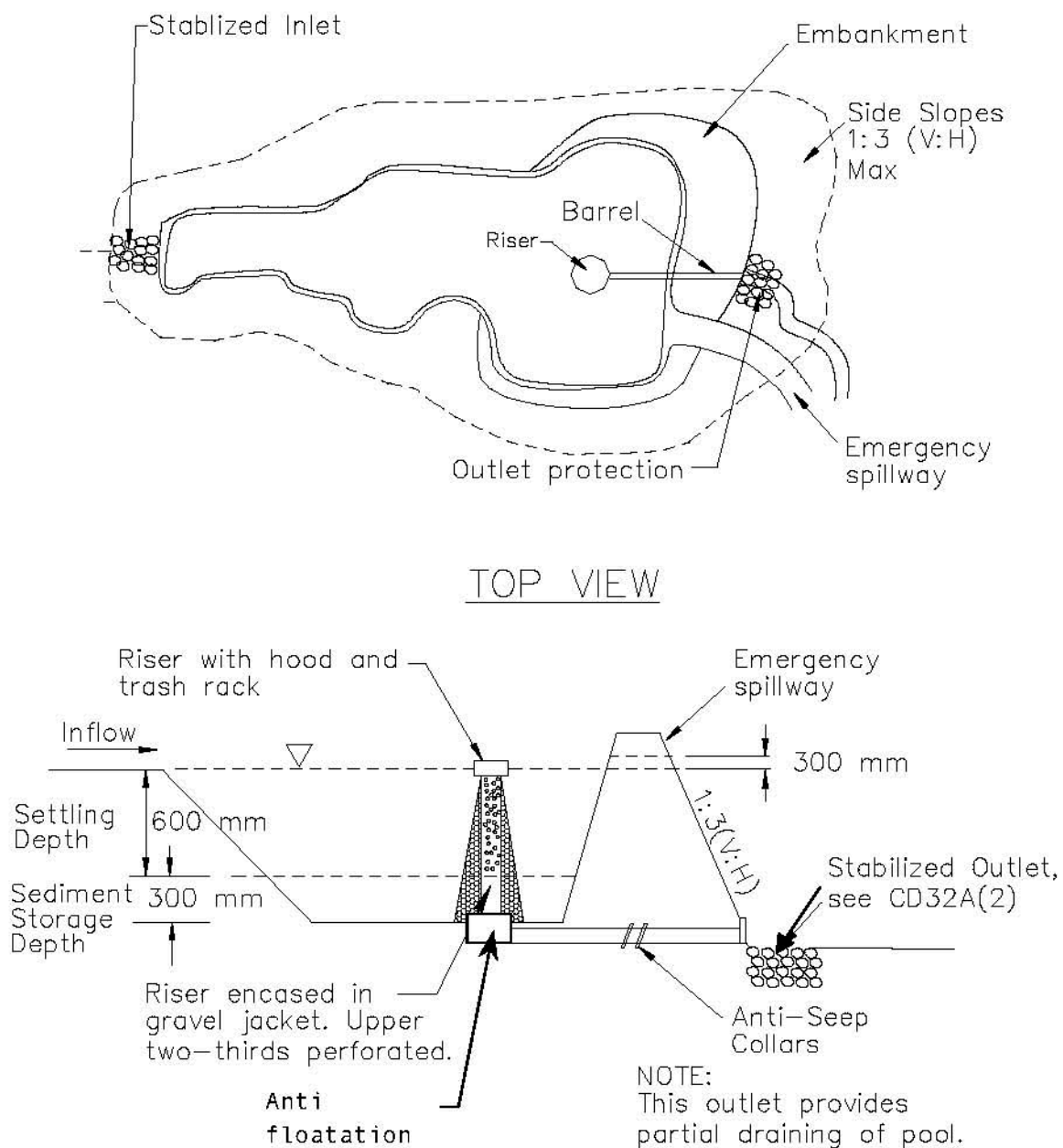
least every 24 hours.

- Examine basin banks for seepage and structural soundness.
- Check inlet and outlet structures and spillway for any damage or obstructions. Repair damage and remove obstructions as needed, or as directed by the RE.
- Remove standing water from the basin within 72 hours after accumulation.
- Check inlet and outlet area for erosion and stabilize if required, or if directed by the RE.
- Remove accumulated sediment when its volume reaches one-third the volume of the sediment storage. Properly dispose of sediment and debris removed from the basin.
- Check fencing for damage and repair as needed or as directed by the RE.



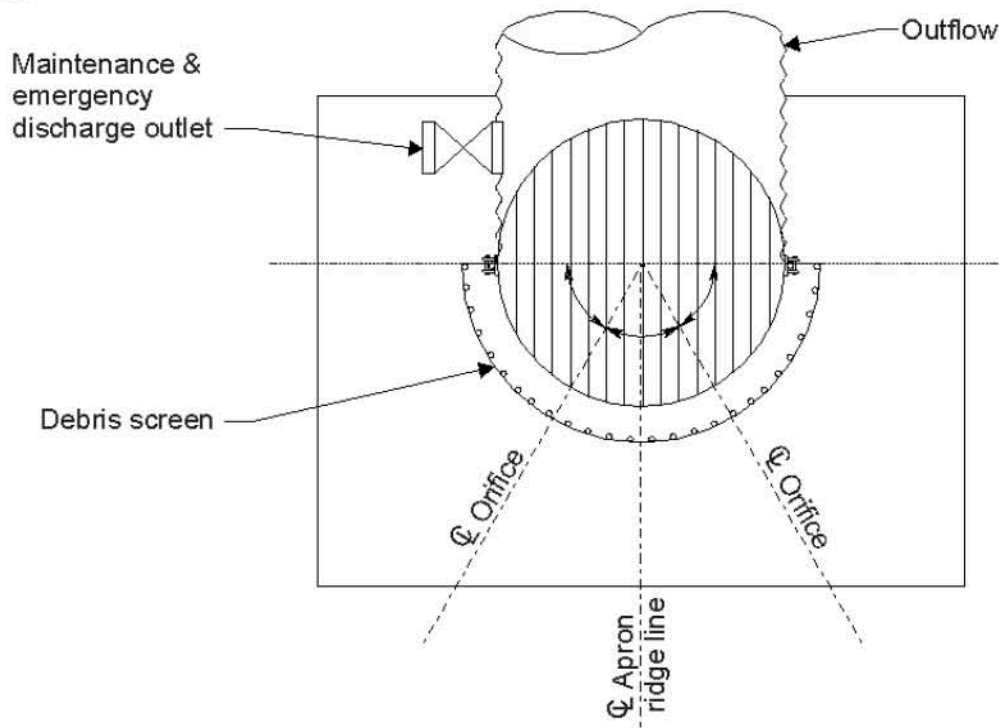
This outlet provides no drainage for permanent pool.

**FIGURE 1: SINGLE ORIFICE DESIGN**  
NOT TO SCALE

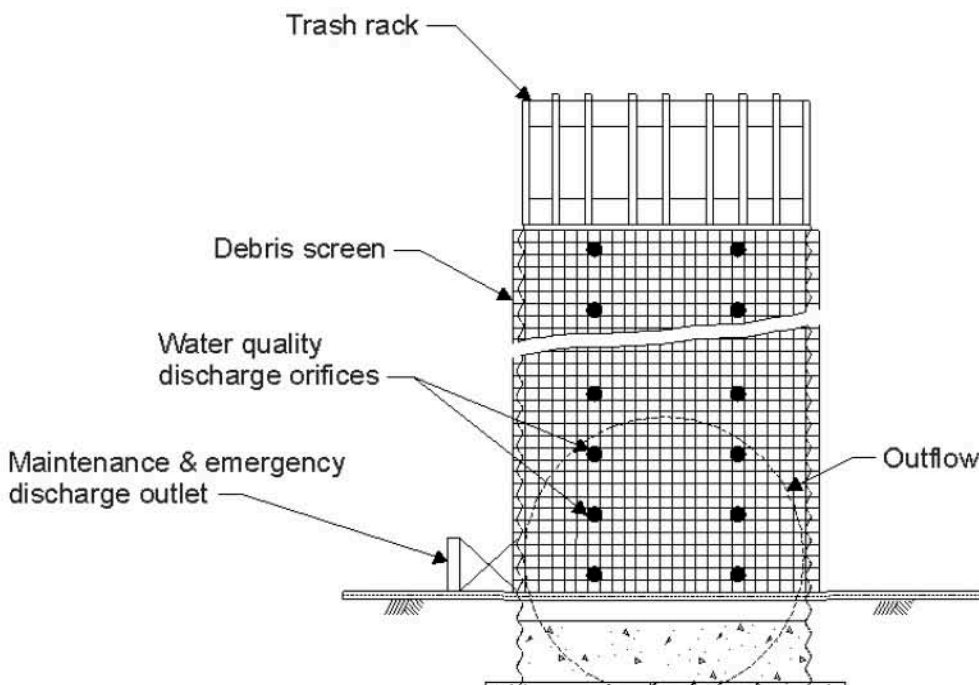


**FIGURE 2: MULTIPLE ORIFICE DESIGN**  
**NOT TO SCALE**

### Plan



### Profile



**FIGURE 3: MULTIPLE ORIFICE OUTLET RISER  
NOT TO SCALE**



# ATTACHMENT F

## OPERATION AND MAINTENANCE PROGRAM FOR TREATMENT BMPS

*(NOTE: INFORMATION REGARDING OPERATION AND MAINTENANCE CAN BE OBTAINED FROM  
THE FOLLOWING WEB SITE:*

*[HTTP://WWW.CO.SAN-DIEGO.CA.US/DPW/WATERSHEDS/LAND\\_DEV/SUSMP.HTML.](http://www.co.san-diego.ca.us/dpw/watersheds/land_dev/susmp.html)*)

### **Operation**

Water quality runoff from the site will be treated by infiltration basins. An infiltration basin is a shallow impoundment that is designed to infiltrate stormwater. Infiltration basins use the natural filtering ability of the soil to remove pollutants. Surface runoff from the site will be directed to one of the two infiltration basins.

### **Maintenance**

Maintenance involves observations to ensure adequate drain time. Since the captured water may be used on-site, pumping could be used to supplement the drain time. The drain time shall be set to prevent vector issues. Trash, debris, and accumulated sediment should be removed on a routine basis and at least every week. Erosion in the basin shall be repaired and stabilized.

# **ATTACHMENT G**

## **FISCAL RESOURCES**

The project and BMPs will be installed and maintained by the Applicant.

# ATTACHMENT H

## CERTIFICATION SHEET

This Stormwater Management Plan has been prepared under the direction of the following Registered Civil Engineer. The Registered Civil Engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.



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Wayne W. Chang, PE 46548

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May 19, 2009

Date

